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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,129	08/16/2001	Jae-Seung Yoon	678-726	3615

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Paul J. Farrell, Esq.
DILWORTH & BARRESE, LLP
333 Earle Ovington Blvd.
Uniondale, NY 11553

EXAMINER

NGUYEN, DAVID Q

ART UNIT	PAPER NUMBER
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2681

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/931,129

Applicant(s)

YOON ET AL

Examiner

David Q Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5 and 7-13 is/are pending in the application.
- 4a) Of the above claim(s) 7-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of the first species containing claims 1,2,4 and 5 in the reply filed on 12/22/04 is acknowledged. The traversal is on the ground(s) that "since the second species includes calculating relative coordinates, which is used in calculating the weight vector to form a transmission/reception beam in the direction of the mobile terminal, the first and second species both relate to generating a weight vector". This is not found persuasive because the claims contain different distinct species and grouped into 2 distinct groups which were presented to Applicant in the restriction requirement.

The requirement is still deemed proper and is therefore made FINAL.

Response to Arguments

2. Applicant's arguments filed 08/27/04 have been fully considered but they are not persuasive.

In response to Applicant's Remarks on page 8, Applicants agree: "Amended Claims 1 and 4 recite that the weight vector is calculated by $W_{T/R} = k_{T/R} \alpha(\theta, \phi, \lambda_T)$. This calculation incorporates the elevation angle of the z-axis and the azimuth angle. Neither of these two elements is disclosed in Ross et al."

Examiner respectfully disagrees because Ross et al. discloses weight vector generator provides an output W based upon position vector g (see col. 4, lines 5-10), the vector g is

calculated by elevation angle and azimuth angle (see col. 3, lines 35-51). Therefore, Ross et al. discloses the weight vector is calculated by $W_{T/R} = k_{T/R} \alpha(\theta, \phi, \lambda_T)$.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1,2,4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al (US 6426720) in view of Rauscher (US 6633762) and further in view of East (US 5400037).

Regarding claim 1, Ross et al disclose an antenna array apparatus of a base station in a mobile communication system, having a mobile station that receives GPS position information of the mobile station from an aircraft tracking (see fig. 1, A/C tracking service 310) and outputs the GPS information representative of the absolute position of the mobile station (see col. 1, line 53 to col. 2, line 9), the apparatus comprising: a position information generator for receiving the GPS position information from the mobile station (see col. 4, lines 36-40; aircraft) and generating position information of the mobile station (see col. 4, lines 36-40 and fig. 1); an array signal processor for calculating a weight vector using the position information to form a transmission beam (see col. 3, line 63 to col. 4, line 51); and forward processor having a transmission beamformer, for forming the beam according to the weight vector in the direction of the mobile station through the transmission beamformer (see col. 3, line 63 to col. 4, line 51). Ross et al do not mention receiving GPS (Global Positioning System) position information of the

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mobile station from satellites; and outputting a transmission message to the antenna array by the transmission beam; wherein the weight vector is an optimum transmission array weight vector calculated by $W_T = k_T \alpha(\theta, \phi, \lambda_T)$ (see col. 3, line 21 to col. 4, line 51), where W_T is the weight vector for the transmission array, W_T is an arbitrary positive real number, and λ_T is the wavelength of the transmission signal and θ is an elevation angle of the z axis by a position data the mobile station receives from the satellite and ϕ is an azimuth angle by a position data that the mobile station receives from the satellites.

Ross et al does not disclose receiving GPS (Global Positioning System) position information of the mobile station from satellites; and outputting a transmission message to the antenna array by the transmission beam.

However, Rauscher discloses a mobile communication system having a mobile station that receives GPS (Global Positioning System) position information of the mobile station from satellites (see col. 6, lines 30-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of Ross et al with Rauscher's system in order to steering the antenna array in the direction of the mobile station accuracy in order to get good signal.

The system of Ross et al in view of Rauscher does not disclose outputting a transmission message to the antenna array by the transmission beam. However, East discloses outputting a transmission message to the antenna array by the transmission beam (see abstract and fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide to provide the above teaching of East to the system of Ross et al in view of Rauscher in order to get good signal and improve signal quality.

Regarding claim 2, the system of Ross et al in view of Rauscher and further in view of East also discloses wherein the transmission beamformer forms transmission beams by generating as many transmission signals as M antenna devices by duplicating the transmission signal and multiplying each duplicated signal by a corresponding forward weight vector generated from the array signal processor, wherein M is a number of antenna devices (see abstract and fig. 2 of East).

Regarding claim 4, Ross et al disclose a reception antenna array apparatus of a base station in a communication system having a mobile station that receives GPS position information of the mobile station from an aircraft tracking (see fig. 1, A/C tracking service 310) and outputs the GPS information representative of the absolute position of the mobile station (see col. 1, line 53 to col. 2, line 9), the apparatus comprising: a position information generator for receiving the GPS position information from the mobile station (see explanation in claim 1) and generating position information of the mobile station (see explanation in claim 1); an array signal processor for calculating a weight vector using the position information to form a transmission beam (see col. 3, line 63 to col. 4, line 51); and a reverse processor having a beamformer, for forming the reception beam according to the weight vector in the direction of the mobile station through the reception beamformer (see col. 3, line 63 to col. 4, line 51). Ross et al do not mention receiving GPS (Global Positioning System) position information of the mobile station from satellites and processing a message received through the antenna array by the reception beam; wherein the weight vector is an optimum transmission array weight vector calculated by $W_R = k_R \alpha(\theta, \phi, \lambda_R)$ (see col. 3, line 21 to col. 4, line 51), where W_R is the weight vector for the reception array, k_R is an arbitrary positive real number, and λ_R is the wavelength of the received

signal and θ is an elevation angle of the z axis by a position data the mobile station receives from the satellite and ϕ is an azimuth angle by a position data that the mobile station receives from the satellites.

Ross et al does not disclose receiving GPS (Global Positioning System) position information of the mobile station from satellites; and processing a message received through the antenna array by reception beam. However, Rauscher discloses a mobile communication system having a mobile station that receives GPS (Global Positioning System) position information of the mobile station from satellites (see col. 6, lines 30-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of Ross et al with Rauscher's system in order to steering the antenna array in the direction of the mobile station accuracy in order to get good signal.

The system of Ross et al in view of Rauscher does not disclose processing a message received through the antenna array by reception beam. However, East discloses processing a message received through the antenna array by reception beam (see abstract and fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide to provide the above teaching of East to the system of Ross et al in view of Rauscher in order to get good signal and improve signal quality.

Regarding claim 5, the system of Ross et al in view of Rauscher and further in view of East also discloses the reception beamformer obtains a final array output signal by receiving signals through M antenna devices, multiplying each antenna device output signal by a corresponding reverse weight generated from the array signal processor, and summing the multiplied signals, wherein M is a number of antenna devices (see abstract and fig. 2 of East).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Q Nguyen whose telephone number is 571-272-7844. The examiner can normally be reached on 8:30AM-5:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moise Emmanuel can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN

David Nguyen


ERIKA A. GARY
PRIMARY EXAMINER